THE GUIDANCE VALUE OF GRADE IX DEPARTMENTAL EXAMINATIONS AND OTHER SELECTED FACTORS IN RELATION TO MATRICULATION OF COMPOSITE HIGH SCHOOL STUDENTS

By

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1958

THE UNIVERSITY OF ALBERTA

THE GUIDANCE VALUE OF GRADE IX DEPARTMENTAL EXAMINATIONS AND OTHER SELECTED FACTORS IN RELATION TO MATRICULATION OF COMPOSITE HIGH SCHOOL STUDENTS

A DISSERTATION

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE

OF MASTER OF EDUCATION

DIVISION OF EDUCATIONAL ADMINISTRATION

by

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EDMONTON, ALBERTA

August, 1958

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ABSTRACT

The principal aim of this study was to determine the guidance value of Grade IX departmental examinations and other selected factors at this level. These factors were studied in relation to the degree to which they indicated students' chances of success with the matriculation program in Composite High Schools. A secondary aim was to present the findings in as meaningful and useful a fashion as possible.

In addition to Grade IX departmental examinations, the factors studied included the Grade IX General Test, relative class standing in Grade IX, honor points determined from Grade IX results, age, and sex. The subjects of the study were Composite High School students who had been enrolled in Grade IX in 1953-54, and who, in writing six Grade XII departmental examinations in June, 1957, were eligible for matriculation.

The importance of this study arises from the objectives of all High Schools, the unique function of Composite High Schools, the responsibility of students and parents for educational decisions, and the concern expressed in regard to this problem by Composite High School officials.

In addition to the traditional academic program, Composite High Schools provide general, commercial, technical and home economics courses. Of the 553 students with whom this study deals, 217 or 39% failed to matriculate. Thus, guidance is essential if students are to enroll in the program which is best suited to them.

Matriculation success and failure constituted the criteria of the study. The major requirements for matriculation are a "B" or higher standing in the required Grade XII courses, and an overall average of at least 60% in these courses. Students who did not fulfil these

requirements failed to matriculate.

The results of this study indicate that the majority of students who fail to matriculate do so in that they do not obtain the "B" standing in one or more subjects. In comparison, only a small percentage fail because they do not obtain the required average. More students failed Mathematics 30 than any other Grade XII subject.

Grade IX General Test scores and aggregate scores on Grade IX departmental examinations were found to bear a substantial positive relationship to the criteria of matriculation success or failure. Relative class standing in Grade IX and honor points gained in Grade IX were found to bear a very significant positive relationship to the criteria of the study.

Grade IX General Test scores were found to bear a substantial positive relationship to aggregate scores on Grade IX departmental examinations. This finding suggests the possible use of Grade IX General Test scores as a predictor of Grade IX achievement itself.

Age was found to be so slightly related to the criteria as to be negligible. No significant differences in matriculation success or failure were found in relation to the sex of a student.

The study indicated that it is possible to give reliable guidance to prospective matriculation students in Composite High Schools on the basis of Grade IX General Test scores, aggregate scores on Grade IX departmental examinations, relative class standing in Grade IX, and honor points gained in Grade IX. When these guidance factors are considered simultaneously, rather than individually, the reliability of the guidance is increased.

ACKNOWLEDGEMENTS

The writer wishes to express his appreciation to Dr. H. T. Sparby, Mr. H. C. Melsness, and Mr. A. B. Evenson for their helpful advice and constructive criticism during the development of the thesis.

The writer also expresses his appreciation to Mr. L. G. Frith, Supervisor of Examinations, Alberta Department of Education, and to his Staff for the kind assistance given while the data were being collected.

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CHAPTER I

THE PROBLEM AND ITS IMPORTANCE

Prediction of scholastic success is important in counselling and has been, therefore, the subject of many theses. Specifically, a great deal of research has been devoted to studying the relationship between high school achievement and subsequent college success.[1] Investigations in this area have contributed much to the problem of counselling students. Furthermore, local validity studies have predicted particular students' chances of successfully completing certain programs in some institutions.[2] Information of this type is of considerable value to the prospective University student.

The many useful findings and the general progress in predicting college success from high-school achievement have encouraged other investigations aimed at determining the factors involved in high school achievement itself.[3] Information, similar to that which is made available through studies at the college level, would be beneficial to the junior high-school graduate. This student, upon entering high school, is immediately faced with important decisions, dealing with the type of program which he should follow, and the particular electives which he should take within this program.

Aims of the investigation. The central aim of this study was to determine the guidance value of departmental examination results and certain other factors at the Grade IX level. The particular guidance

value sought was the degree to which these factors could be used to indicate a student's probable success or failure. The criteria of success or failure were defined in terms of the student's performance in the matriculation program offered in Composite High Schools in the Province of Alberta.

Another aim of this study, scarcely less important than its central aim, was to present the statistical findings of the study in as meaningful and useful a fashion as possible.

Importance of the investigation. The traditional role of the Canadian High School has recently been challenged in such provinces as British Columbia, Alberta, and Ontario. The unique purpose of preparing students for entry into university is no longer regarded as the only justification for the existence of a high school. Large numbers of pupils are attending high schools in Canada today, who do not have either the desire, or the ability to go on to university. These students are preparing for careers which should take them along other routes. Their goals are not the goals of the prospective university student. It is wasteful, and often detrimental, to place these students in programs which move them toward objectives in which they are not interested. Such programs soon become meaningless for them. Further, it does not seem just that students who are not planning to attend university should be forced to enroll in a university preparatory program. The matriculation or academic program has not been designed for these students; it is not, therefore, suitable for them.

enrolls in a Composite High School. In the latter case, a student must first choose one of several broad programs; having made this choice, he is then faced with the selection of elective subjects within that program.

In England, as in Canada, parents are anxious that their children be educated according to their ability and aptitude.[4] In England, the "eleven plus" examinations are used in an attempt to achieve this objective.[5] These examinations are written, as suggested by their name, at about the age of eleven and are used as the measure of the ability and aptitude of students who attend publicly supported schools in Britain. On the basis of these examination results, students are enrolled in particular types of schools, and in particular programs for which they seem best suited. They are, then, being educated according to their ability and aptitude as measured by these examinations. Neither students, nor parents, therefore, are faced with the need for making a decision as to further educational program, in the publicly supported schools. The choice is made for them, by the educational officials, on the basis of the examination results.

In contrast to the British system, this choice in Canada is not made by educational officials. Responsibility for such decisions here has traditionally rested in the hands of the student and his parents. A student entering Grade X is free to enroll in any of the educational programs offered in the high school which he is attending. While this procedure is generally deemed wise on the North American continent, its ultimate efficiency and effect on the student are very often the subject

Hence, Composite or Comprehensive High Schools are being established in many Canadian centres. These schools have been designed to provide suitable and beneficial educational programs for all students. They are thus serving not only students who are contemplating future university education, but also those who are not. The provision of courses described as general, commercial, technical, and home economics, in addition to academic, is, in the opinion of the writer indicative of progress, provided, of course, these programs are well prepared and challenging.

One of the most important objectives of Composite High Schools, therefore, is to provide a range of programs within which all high school students may profitably work. However, the mere provision of the physical facilities, and the inclusion of a wide range of programs in such schools are not in themselves the complete solution. Because of its size, the complexity of its operation, and the diversified character of its program, the Composite High School is faced with many special problems. One of the most important and pressing is the guidance of pupils into programs best suited to them. This problem is so closely related to the nature of the Composite High School, that the success of the school depends, to a large extent, on its solution. At the same time, the problem is one of the most difficult with which students and school officials alike are confronted. It is recognized, of course, that this problem is present to some extent, in any high school which provides elective subjects, even though such a school may offer but one main program. Nevertheless, the situation is more complex when a student

of controversy. In such cases, people are concerned, not so much with the right to make such a decision, but rather with the method by which the decision is made. A decision which is to be intelligent and beneficial to the student, must be made on the basis of a proper foundation. In the British system, as already mentioned, the basis is the "eleven plus" examination. It is the purpose of this study to examine the basis used in Canada with particular reference to the Composite High Schools in Alberta.

The Senior High School Handbook for the Province of Alberta states that, "The prime aim of the school is to assist each Alberta youth in his growth towards maximum self-realization".[6] Of the 553 Composite High School students included in this study, 217, or thirty-nine per cent, failed to meet matriculation requirements. Many of them failed several subjects and were, it would seem, enrolled in programs not well suited to them. This statement becomes more significant when the number of other programs available to students within such schools is considered.

On March 27, 1956, a conference of Composite High School administrators was held in Calgary. The purpose of this assembly was to discuss the major problems confronting Composite High Schools. In a subsequent report of the conference, the following question stands first in a summary and restatement of the major problems submitted: "Within the present scope of Composite High School programs, how should students be placed in programs to which they are best suited by way of ability, aptitude, past achievement, and interests?"[7]

In summary, then, it may be stated that the present investigation grew out of the four following considerations: (1) the prime aim of all high schools; (2) the unique function of Composite High Schools; (3) the responsibility of the student and his parents for making educational decisions; and (4) the present concern on the part of Composite High School officials for guiding students into programs best suited to them.

[1]Benjamin S. Bloom, and I deV. Heyns, "Development and Application of Tests of Educational Achievement," Review of Educational Research, 26:72-88, February, 1956.

[2]George E. McCabe, "Test Interpretation In the High School Guidance Program," Personnel and Guidance Journal, 35:449-451, March, 1957.

[3]H.G. Gough, "What Determines The Academic Achievement of High School Students?" Journal of Educational Research, 46:321-31, January, 1953.

[4]Ministry of Education, The Educational System of England and Wales (revised edition, August, 1957), p.8.

[5]D.V. Skeet, The Child of Eleven (London: University of London Press Ltd., 1957), pp.19-39.

[6]Province of Alberta, Department of Education, Senior High School Handbook: 1957 (Edmonton: Queen's Printer for Alberta, 1957), p. 5.

[7]Composite High School Conference Report (Calgary, March 27, 1956), p.8. (Mimeographed.)

CHAPTER II

REVIEW OF RELATED LITERATURE

Much time and study has been devoted to the problem of predicting success at the university level. Bloom and deV. Heyns summarized the major findings of the research in this area in 1956.[1] In so doing, they expressed a feeling of frustration because of the vast quantities of literature available on the topic.[2] In contrast to this situation, relatively little attention has been given to the parallel question of predicting high school success. Nevertheless, research relating to high school achievement has resulted in some significant findings.

Factors involved in high school achievement. The major concern of research dealing with achievement in high school has been the determination of the factors responsible for achievement. In England, considerable attention has been given to the 11 plus examinations, from the point of view of their efficiency in predicting academic achievement. This attention has resulted from the fact that these examinations are used for selection purposes and their reliability is, therefore, subject to continuous study.

Emmett and Wilmut, studying the prediction of School Certificate performance, obtained a very high correlation of .84 between the pooled 11 plus transfer tests and the pooled School Certificate results.[3]

In another study of the prediction success of entrance examinations, Peel and Ruther found that the standardized intelligence test

was the best single predictor of achievement with regard to School Certificate results. This finding held true whether the examinations were considered in relation to their prediction of success in the Arts or the Science programs. This series of entrance examinations included English and Arithmetic tests, as well as the Intelligence test.[4]

Peel and Armstrong, in a study of the use of essays in selection at 11 plus, found that the most efficient predictor of academic success was a battery of tests which included English Composition, Moray House English, and the Moray House Intelligence test.[5]

Wrigley made a survey to test the generally accepted view of educational psychologists in Britain that the Intelligence test is the best predictor of success in the grammar school.[6] His survey confirmed this view. He also found, however, that a battery of three tests resulted in more efficient predictions.[7]

Wellman, in a study of high school achievement, reported that Otis I.Q. scores contributed more to the prediction of success than any of the other variables he had examined.[8] He further found that his predictions were improved significantly by considering other selected factors.[9]

Stagner, studying academic achievement in 1933, reported only negligible relationships between personality tests and grade averages.[10]

Harris, in studies of college achievement, found motivation to be the most important non-intellectual factor involved.[11] Motivation was followed in importance by other personal, social, and economic

characteristics.

Gough, studying high school achievement in 1949, reported a growing realization that non-intellectual factors must be assessed, if the margin of prediction error was to be diminished.[12] Studying the non-intellectual factors further in 1953, Gough found that the attempts to relate these factors to scholastic achievement had not been particularly successful.[13]

May, in an early study of academic achievement, concluded that intelligence and degree of application were the most reliable predictors of academic success.[14]

With regard to this important factor of motivation, Frandsen and Sessions found that while some students are motivated to some extent by interests, others are more highly motivated by extrinsic factors.[15] These two groups were found not to differ either in average scholastic achievement, or in quality of personal adjustment.[16]

Myers studied the possible relationship between biographical factors and academic achievement. He was able to increase a multiple correlation of .62 to .65 by adding a biographical score to the prediction battery of average high school grade and two aptitude test scores.[17]

Schultz and Green, studying the relationship between achievement, and attitudes and interests, found a small but positive correlation.[18]

In 1949, Black and Ulmer studied the efficacy of Grade IX marks

in predicting Grade XII success.[19] Their study represents the first such investigation in the Province of Alberta. The subjects of the study were city, town, and rural students, who had completed Grade XII in 1941, 1942, or 1943. A stratified random sample of five hundred students was used in this study. Measuring the relationship between scores on corresponding Grade IX and Grade XII subjects, and between the averages for the entire sample, and for several sub-groups, the authors obtained correlation coefficients ranging from 0.40 to 0.74. The various correlation coefficients were found to have a predictive efficiency ranging from 8.3 per cent to 32.7 per cent better than a guess.

The authors concluded that a Grade XII score predicted from a Grade IX score was not very accurate, and therefore, of little practical use. They recommended for further study that a prediction measure made up of a number of factors be sought.

Moysa, in 1950, studied the comparative value of prediction tests, administered in the University High School between 1946 and 1948.[20] His aim was to determine which tests showed the greatest promise in predicting scholastic achievement in the High School. The tests used were six intelligence tests, and two reading achievement tests. The author found that no one intelligence test proved itself superior in predicting academic achievement throughout the high school grades. He further found that neither reading test was superior to the other in predicting achievement. However, each test used at each grade level

indicated a significant or a highly significant relationship with academic achievement. The author concluded that these intelligence tests and reading achievement tests could be relied upon to predict academic achievement in the high school, with a reasonable degree of accuracy.

In 1953, Evans selected for study the 1945 Grade IX class, and traced the progress of this class in their subsequent high school careers.[21] He compared the records of students classified into A,B, and C categories from the point of view of their duration of attendance in high school, their performance in compulsory, academic and optional subjects, and their perseverance in repeating subjects. Four hundred students, from each category, were selected at random from the 1945 Grade IX class.

The duration of time spent in high school was found to be greatest among "A" students, with over half of the "C" students dropping out by the end of Grade X. Of the original four hundred students representing each group, 3 "C" students, 107 "B" students, and 268 "A" students obtained High School Diplomas. From the point of view of performance, though all categories of students performed satisfactorily in optional subjects, "A" students were superior to "B" and "C" students in both compulsory and academic subjects. Both "A" and "B" students displayed greater determination in repeating subjects.

Summarizing the results of these studies, it is quite evident that intelligence, as measured by intelligence tests, plays a very im-

portant role in academic achievement at the high school level. This conclusion is in agreement with the findings in relation to achievement at the college level. With reference to the non-intellectual factors involved in achievement, motivation would appear to be the most significant at the high school level, as at the college level. Though research has indicated the influence of other personal, social, and economic factors on academic achievement, it has had little success in determining the extent of this influence.

Limitations of past prediction studies. While reviewing the research related to high school achievement, the present writer found that the emphasis was centered on the construction of the perfect prediction equation through an assessment of a great number of factors. An attempt has been made, and is still being made, to find and properly weight the many and varied factors influencing scholastic achievement. In this regard, Travers criticized much of the time and effort devoted to prediction studies, when he said:

> Second, it should be noted that a multitude of the studies under consideration are based on the belief that the main reason for the inadequacies of present prediction is that the tests do not adequately measure the factors within the individual which made for success.[22]

He further stressed that the viewpoint behind these studies needs to be examined, based as it is on the assumption that the individual's own qualities are entirely responsible for his success and failure and that the person who has the right qualities, will inevitably succeed. In Travers' opinion, this is an idealistic position to take, hardly

justifiable in view of so many unplanned events, largely outside the domain of those that can be predicted from tests and other data available to the counselor.[23]

In regard to counselors, it has been found that there is a wide range in their ability to predict success of students. Counselors were found to be more accurate in predicting for bright students than for dull students. They consistently under-estimated the school performance of the duller pupils, and overestimated school performance of the brighter ones.[24]

In all too many cases, the concern of past research appears to have been with the statistics of these studies, rather than with the students for whom the results of the studies should have provided guidance. There is growing criticism of this misplaced emphasis, and more attention is being directed to the guidance value of examinations and tests in relation to the student. McConn, reviewing all proposed objectives of testing in schools, maintained that there is but one proper function of testing, namely, the guidance of the pupil being tested.[25] Cronbach expressed the same point of view when he stated that, "Prediction is the ultimate justification for the achievement test used for grading in school."[26] He further maintained that grading is warranted primarily because it predicts the pupil's future ability in relation to some activity. Cronbach concluded that if the achievement test does not fulfil the predictive function, grading will likely not be worth the trouble it causes.[27]

The proper objective of prediction studies is the provision of information whereby students might make more intelligent and rewarding decisions. Fredericksen stressed the importance of this often neglected function when he stated:

> The longer I have tried to counsel students, the more I have been impressed with the lack of adequate information on which to base interpretation of test scores. Even when dealing with prediction of academic success, which has been studied more thoroughly than any other prediction problem, I often feel the handicap of a lack of useful information to give to the student sitting across from my desk who wants to know his chances of being successful in some academic undertaking.[28]

Not only is there a demand for increased attention to making the results and findings of studies more meaningful, but consumers of research are demanding local validity studies. Dyer indicates the importance of validity studies by pointing out that the local situation always has features peculiar to itself.[29] McCabe reiterates the importance of local validity studies; further he brings out an often neglected point when he emphasizes the presence of meaningful relationships which are useful in counselling, but which may not be revealed by the use of the correlation techniques.[30] Fredericksen also recommends local validity studies and the publication of their results. A counselor would then be able to indicate to a student his chances of success in a particular program, and give the student advice that was justified by the findings of the particular study under consideration.[31] He suggests that an author should compute the regression equation and error of estimate, and then present the results in the form of an expectancy table or a computing diagram.[32] In this way, the results of the study would be most useful.

Implications of the literature for the present study. In view of the literature on high school achievement, the present investigation has been organized so as to determine the guidance value of certain factors which are available for the counselling of the Grade IX graduate. An attempt has been made to present the findings in as meaningful and as useful a fashion as possible from the point of view of the guidance of the student. To achieve this aim, statistics have been the means rather than the end.

[1]Benjamin S. Bloom, and I. deV. Heyns, "Development and Application of Tests of Educational Achievement," Review of Educational Research, 26:72-88, February, 1956.

[2]Ibid., p. 77.

[3]W.G. Emmett, and F.S. Wilmut, "The Prediction of School Certificate Performance in Specific Subjects, " British Journal of Educational Psychology, 22:60, February, 1952.

[4]E.O. Peel, and D. Ruther, "The Predictive Value of the Entrance Examinations as Judged by the School Certificate Examinations." British Journal of Educational Psychology, 21:35, February, 1951.

[5]E.O. Peel, and H. G. Armstrong, "The Use of Essays in Selection at 11 plus," British Journal of Educational Psychology, 26:168, November, 1956.

[6]Jack Wrigley, "The Relative Efficiency of Intelligence and Attainment Tests as Predictors of Success in Grammar Schools," British Journal of Educational Psychology, 25:107-116, June, 1955.

[7]Ibid., pp. 115-16.

[8]F.E. Wellman, "Differential Prediction of High School Achievement Using Single Score and Multiple Factor Tests of Mental Maturity," Personnel and Guidance Journal, 35:516, April, 1957.

[9]Ibid.

[10]R.Stagner, "The Relation of Personality to Academic Aptitude and Achievement, "Journal of Educational Research, 26:648-660, 1933.

[11]D.Harris, "Factors Affecting College Grades: A Review of the Literature, 1930-1937," Psychological Bulletin, 37:125-166, 1940.

[12]Harrison G. Gough, "Factors Relating to the Academic Achievement of High School Students," Journal of Educational Psychology, 40: 65, 1949.

[13]H.G. Gough, "What Determines the Academic Achievement of High School Students?" Journal of Educational Research, 46: 321-31, January, 1953.

[14]M.A. May, "Predicting Academic Success," Journal of Educational Psychology, 14:439, 1923.

[15]Arden N. Frandsen, and Alwyn D. Sessions, "Interests and School Achievement," Educational and Psychological Measurement, 13:101, Spring, 1953.

[16]Ibid.

[17]Robert Cobb Myers, "Biographical Factors and Academic Achievement: An Experimental Investigation," Educational and Psychological Measurement, 12:426, Autumn, 1952.

[18]D.G. Schultz, and B.F. Green, Jr., "Predicting Academic Achievement with a New Attitude-Interest Questionnaire-II," Educational and Psychological Measurement, 13:63, Spring, 1953.

[19]D.B. Black, and H.F. Ulmer, "The Value of Grade IX Departmental Examinations In Predicting Success at the Grade XII Level" (unpublished Master's thesis, The University of Alberta, Edmonton, 1949)

[20]William Moysa, "A Study of the Comparative Value of Prediction Tests Administered in the University High School:1946-1948" (unpublished Master's thesis, The University of Alberta, Edmonton, 1950)

[21]K.L. Evans, "The Academic History of the 1945 Grade IX Class In Their Subsequent High School Careers" (unpublished Master's thesis, The University of Alberta, Edmonton, 1953)

[22]Robert M.W. Travers, "The Prediction of Achievement," School and Society, 70:293, November, 1949.

[23]Ibid.

[24]J.L. Walker, "Counselors' Judgements in the Prediction of the Occupational and Educational Performance of Former High School Students," Journal of Educational Research, 49:81-91, October, 1955.

[25]Herbert E. Hawkes, and others (eds.), The Construction and Use of Achievement Examinations (Boston: Houghton Mifflin Company, 1936) pp. 443-478.

[26]Lee J. Cronbach, Essentials of Psychological Testing (New York: Harper and Brothers, 1949), p. 9.

[27]Ibid., p. 10.

[28]Norman O. Frederickson, "Making Test Scores More Useful For Prediction," Educational and Psychological Measurement, 11:783, 1951.

[29]Henry S. Dyer, "The Need for Do-It-Yourself Prediction Research in High School Guidance," Personnel and Guidance Journal, 36: 162-7, November, 1957.

[30]George E. McCabe, "Test Interpretation In the High School Guidance Program," Personnel and Guidance Journal, 35:449, March, 1957.

[31]Fredericksen, op. cit., p. 784

[32]Ibid., p. 785.

CHAPTER III

METHOD AND DEFINITIONS

Method of procedure. The guidance value of the selected factors was studied in relation to the matriculation program only, for two reasons. In the first place, large numbers of students are failing the matriculation program each year; for this reason guidance information is an immediate requirement in relation to this program in particular. Secondly, selection of the matriculation program proved to be a satisfactory method of delimiting a very broad problem. At the same time the number of students enrolled in this program was sufficiently large to make possible the drawing of reliable conclusions.

Sources of the data. All examination results and other data with which this study deals were obtained from the records on file with the Examinations' Branch of the Department of Education of the Province of Alberta. The following schools were included in this Composite High School study: Strathcona, Victoria, Eastglen, Lindsay Thurber, Western Canada, Crescent Heights, Lethbridge Collegiate and Alexandria Composite.

The subjects of the study. The subjects of this study were Composite High School students who wrote at least six Grade XII external examinations (academic program) in June, 1957. Only such students were included in the study because matriculation success and failure were

the criteria and only such students were eligible for matriculation. Further, an attempt was made to eliminate the possible effects of retardation and temporary withdrawal on high school achievement. From this point of view, to be included in the study, students must have been in Grade IX in the school year 1953-54. Thus, the subjects of this investigation were those students who progressed through the Senior High School grades in three years. Students, whose high school work was interrupted because they left school for a year or more after completing Grade IX, or because they repeated all or part of a grade, were automatically excluded from the study. The 553 students with whom this investigation deals do not then constitute a statistical sample of the Composite High School Students enrolled in the matriculation program. To all intents and purposes, they constitute the Composite High School population in this regard.

The selection of guidance factors to be studied. In order to determine the factors to be selected for the purposes of this study, the student's Grade IX permanent record card was examined. Many facts pertinent to the student and his educational progress are recorded on this card. The factors selected for this study included marks on Grade IX departmental examinations, standing in the Grade IX class, the number of honor points gained, the raw score on the Grade IX General Test of Learning Capacity, age, and sex.

Marks on departmental examinations, class standing, and honor points gained were selected as measures of past achievement to be related to subsequent high school achievement. The student's raw score

on the General Test was selected as a measure of potential learning capacity, and age and sex factors were included in order to determine any significant differences which might be attributable to these characteristics.

Additional factors were available for use in the study but were discarded for various reasons. For example, scores on individual Grade XII external examinations were not considered as such, because the study is essentially concerned with the student's general standing rather than his results on specific subjects. It was found that various types of I.Q. tests had been administered to most of the students. However, scores on these tests were not selected for use in this study because different tests had been administered to different groups of students at different times. Teachers' estimates of pupils' ability had also been recorded. These estimates were not considered for the purposes of this study because of their possible lack of objectivity.[1] Trevor, writing on school marks, reported that such factors as actual attainment, teacher-pupil relationship, deportment, sex, promptness, attendance, personal appearance, obedience, effort and attitude had been found to affect the marks which teachers assign their pupils.[2] His results indicated a tendency for most-liked pupils to be marked higher than their accomplishment would justify, whereas the least-liked pupils were assigned marks lower than their actual attainment.[3]

Definitions. Certain terms which are vital to a full understanding of the investigation are here defined.

(a) Matriculation requirements: are those requirements which have been established by the University of Alberta.[4] Thus, to matriculate, a student must possess a High School Diploma, a B or higher standing in the required courses of Grade XII, as set forth in the prescriptions of the various Schools and Faculties of the University, and an overall average of at least sixty per cent.

(b) Pass student: for the purposes of this study indicates a student who was successful with the matriculation requirements.

(c) Fail student: for the purposes of this study indicates a student who was unsuccessful in relation to one or more of the matriculation requirements. It is to be noted here that changes resulting from students' supplementary examinations were not considered in this study; the results used were those originally obtained by the student.

(d) Grade IX aggregate score: represents the sum of the scores obtained by a student on his Grade IX departmental examinations.

(e) Grade IX General Test score: represents the raw score obtained by the student on the Dominion Group Test of Learning Capacity. This test was administered to all Grade IX students in 1954, while they wrote the departmental examinations.

(f) Relative class standing: refers to the relative achievement of a Grade IX student, within his own school, on the basis of his achievement in that school during the school year 1953-54.

(g) Honor points: For the purposes of this study, students were assigned, by the writer, four honor points for each H, three honor points for each A, two points for each B, and one point for each C classification they obtained in indication of their external examination results. The maximum number of honor points obtainable was twenty-four, on the basis of six external examinations.

[1]S.Trevor Hadley, "A School Mark-Fact or Fancy?" Educational Administration and Supervision, 40: 305-12, May, 1954.

[2]Ibid., p. 305.

[3]Ibid., p. 308.

[4]Province of Alberta, Department of Education, Senior High School Handbook: 1957 (Edmonton: Queen's Printer for Alberta, 1957), p. 28

CHAPTER IV

STATISTICAL FINDINGS OF THE STUDY

This section presents the statistical findings of the study and describes the methods by which the data were treated in determining the relationship between the selected guidance factors and the criteria of matriculation success and failure.

General Test findings. In June, 1954, the Dominion Group Test of Learning Capacity, Intermediate, 1950 Edition, Form B, the Alberta Edition, was administered to all Grade IX students in the Province of Alberta. This test was written along with the Grade IX departmental examinations.

Table I shows the distribution of students' Grade IX General Test scores in relation to the students' subsequent matriculation success or failure. Of the 553 students with which this study deals, 336 were successful in matriculating, while 217 failed. For the pass group of students, the General Test scores ranged from thirty-eight to seventy-three; for the fail group, scores on the General Test ranged from thirty to seventy-three. The mean raw score for the pass group was found to be 61.02, while the mean raw score for the fail group was 55.89.

It might be well indicated here that the mean raw score for all Grade IX students who wrote the General Test in 1954 was 46.96 with a standard deviation of 12.47.[1] The mean raw score for the Composite High School group of this study was 59.01 with a standard

TABLE I

DISTRIBUTION OF STUDENTS' GRADE IX GENERAL TEST SCORES IN RELATION TO SUBSEQUENT MATRICULATION SUCCESS OR FAILURE

General Test Scores	Total Number of Students	Number who passed	Number who failed
70-73	26	20	6
66-69	97	82	15
62-65	107	73	34
58-61	111	64	47
54-57	95	56	39
50-53	49	20	29
46-49	38	12	26
42-45	18	8	10
38-41	7	1	6
34-37	2		2
30-33	3		3
Totals	553	336	217
Mean	59.01 (σ=7.68)	61.02	55.89

($N = 553$, $r_{bis} = .41$, $\sigma\, r_{bis} = .05$)

deviation of 7.68.

Students had been assigned scores on the General Test but had been classified only in two categories in relation to matriculation results. Therefore, to determine the relationship between these two factors, a bi-serial coefficient was established. The bi-serial coefficient may be interpreted in the same way as the product-moment r.[2] An r_{bis} of .41 and a σr_{bis} of .05 were obtained. Thus, a fairly substantial positive relationship was indicated, at the .01 level, between Grade IX General Test scores and the Grade XII criteria of matriculation success and failure.

Grade IX aggregate score findings. Table II shows the distribution of the students' aggregate scores on the Grade IX departmental examinations, in relation to their subsequent success and failure at the Grade XII level. The aggregate scores for the pass group ranged from 300 to 525; for the fail group, these scores ranged from 225 to 525. The mean aggregate score for the entire group was 407.08 with a standard deviation of 53.25. This compared to the mean aggregate score of 425.99 for those who passed, and 375.94 for those students who failed.

With a bi-serial coefficient of .58 and a standard deviation of .04, a fairly marked positive relationship was indicated between Grade IX aggregate scores on departmental examinations and the matriculation pass and fail criteria. This relationship was found to be significant at the .01 level.

TABLE II

DISTRIBUTION OF STUDENTS' AGGREGATE SCORES ON GRADE IX EXTERNAL EXAMINATIONS IN RELATION TO SUBSEQUENT MATRICULATION SUCCESS OR FAILURE

Aggregate Scores	Total Number of Students	Number who passed	Number who failed
500-525	19	17	2
475-499	38	37	1
450-474	79	66	13
425-449	70	52	18
400-424	88	65	23
375-399	102	45	57
350-374	84	36	48
325-349	35	14	21
300-324	28	4	24
275-299	5		5
250-274	4		4
225-249	1		1
Total	553	336	217
Mean	407.08 (σ= 53.25)	425.99	375.94

($N = 553$, $r_{bis} = .58$, $\sigma r_{bis} = .04$)

Because both General Test scores and Grade IX aggregate scores on the departmental examinations were found to have a fairly marked positive relationship with the Grade XII criteria, the relationship between the General Test scores and the Grade IX aggregate scores was measured. As shown in Table III, the product-moment correlation coefficient was found to be .64. This coefficient indicated a substantial positive relationship between these two factors, and thus partly explained their mutual relationship with the criteria. This relationship suggests the possibility of making use of the Grade IX General Test as a guide to Grade IX achievement.

Relative class standing findings. Table IV pictures the relationship between the Grade IX class standing of the students and their subsequent matriculation success or failure. The chi-square test was used to compare the matriculation results with those which would have been expected in the absence of any real association between relative class standing in Grade IX and subsequent matriculation success or failure. The data were accordingly computed,[3] and a X^2 of 73.96 was obtained. With three degrees of freedom, a P of less than .01 was indicated. The null hypothesis could, therefore, be rejected, and a very marked relationship was seen to exist between the relative class standing of a Grade IX student and his subsequent success or failure in meeting matriculation requirements in Grade XII. To provide a measure of correlation the coefficient of contingency was computed on the basis of the value of the X^2.[4] Testing the significance of C on the basis of the significance of its equivalent X^2,[5] the obtained C of .35 was found to be very significant at the .01 level.

TABLE III

CALCULATION OF THE CORRELATION BETWEEN GRADE IX GENERAL TEST SCORES AND GRADE IX AGGREGATE SCORES

General Test Scores	Aggregate Scores 225-249	250-274	275-299	300-324	325-349	350-374	375-399	400-424	425-449	450-474	475-499	500-525	fy	y^1	fy^1	fy^2	Σx	$\Sigma x^1 y^1$
70-73								2	4	8	6	6	26	3	78	234	88	264
66-69						3	5	15	19	27	19	9	97	2	194	388	252	504
62-65					2	8	16	23	22	23	10	3	107	1	107	107	179	179
58-61				4	7	14	30	21	15	14	5	1	111	0	(379)	0	78	0
54-57				4	11	23	27	19	9	1		1	95	-1	-95	95	-12	12
50-53			1	6	6	17	14	5					49	-2	-98	196	-46	92
46-49				5	2	13	11	6	1				38	-3	-114	342	-24	72
42-45			3	4	5	1	4	1					18	-4	-72	288	-34	136
38-41		2		2	1		2						7	-5	-35	175	-18	90
34-37		1	1										2	-6	-12	72	-9	54
30-33	1			2									3	-7	-21	147	-12	84
															(-447)			
fx	1	3	5	27	34	79	109	92	70	73	40	20	553		-68	2044	442	1487
x^1	-6	-5	-4	-3	-2	-1	0	1	2	3	4	5						
fx^1	-6	-15	-20	-81	-68	-79(-269)		92	140	219	160	100(711)	442					
fx^2	36	75	80	243	136	79		92	280	657	640	500	2818					
Σy	-7	-16	-20	-71	-52	-86	-88	8	60	100	66	38	-68					
$\Sigma x^1 y^1$	42	80	80	213	104	86	0	8	120	300	264	190	1487					

$\sigma y = 4\sqrt{\frac{2044}{553} - .0144}$

$= 4 \times 1.92 = 7.68$

$\sigma x = \sqrt{\frac{2818}{553} - .64} \times 25$

$= 25 \times 2.11 = 52.75$

$r = \frac{\frac{1487}{553} - (.80 \times .12)}{1.92 \times 2.11}$

$= .64$

$\bar{y} = .64 \times \frac{7.68}{52.75} x = .09x$

$\bar{x} = .64 \times \frac{52.75}{7.68} y = 4.41y$

$Y - 59.02 = .09(X - 367.5)$

$\bar{Y} = .09X + 25.94$

$X - 367.5 = 4.41(Y - 59.02)$

$\bar{X} = 4.41Y + 107.22$

$\sigma(\text{est } Y) = 7.68\sqrt{1 - .64^2}$

$= 5.91$

$\sigma(\text{est } X) = 52.75\sqrt{1 - .64^2}$

$= 40.62$

$cy = -\frac{68}{553} = .12$ $\quad cyi = .12 \times 4 = .48$ $\quad cx = \frac{442}{553} = .80$ $\quad cxi = .80 \times 25 = 20$

$c^2y = .0144$ $\quad M_y = 59.5 - .48 = 59.02$ $\quad c^2x = .64$ $\quad M_x = 387.5 - 20 = 367.5$

TABLE IV

STUDENTS' GRADE IX CLASS STANDING IN RELATION TO SUBSEQUENT MATRICULATION SUCCESS OR FAILURE

Class Standing	Total Number of Students	Number who passed		Number who failed	
		Actual	Expected	Actual	Expected
Top quarter	385	279	(233.9)	106	(151.1)
Second quarter	137	48	(83.2)	88	(53.8)
Third quarter	27	7	(16.4)	20	(10.6)
Bottom quarter	4	1	(2.4)	3	(1.6)
Total	553	336		217	

$X^2 = 73.96$ df = 3 P is less than .01

C = .35 (very significant at the .01 level)

NOTE: The figures in parentheses represent independence values, which give the number of students who should be expected to pass and fail within each class quarter, in the absence of any real association between class standing and matriculation success and failure.

Age differences. Table V shows the relationship between the age of Grade IX students and their subsequent matriculation success or failure. The null hypothesis was tested in relation to the observed age differences in relation to the Grade XII criteria. With a X^2 of 7.89 and three degrees of freedom, a slight relationship was indicated at the .05 level. Thus the obtained C of .10 was also considered of slight significance at the .05 level. Most of the students included in the study were found to be in the fourteen to fifteen year age group. Thirty-seven students were sixteen years of age and over, while twenty were less than fourteen years old. Of these twenty, who apparently had been accelerated at some point, seventy-five per cent passed the matriculation program. Of the thirty-seven over-age pupils, approximately fifty per cent succeeded with the program.

Table VI, on page 35, shows a further test of the age differences as treated by a tetrachoric coefficient of correlation. The r_t was found to be .16 indicating the same slight relationship between the age of Grade IX students and their subsequent matriculation success and failure.

Sex differences. Table VII, page 36, presents the sex differences as they relate to the criteria of success and failure. In order to determine the significance of the sex differences, the null hypothesis was tested. With a X^2 of .24 and one degree of freedom, a P of between .50 and .70 was obtained, indicating no significant relationship between the sex of a student and matriculation success or failure. The null hypothesis was retained. The obtained C of .02 was considered of no significance.

TABLE V

STUDENTS' AGE IN GRADE IX IN RELATION TO SUBSEQUENT MATRICULATION SUCCESS OR FAILURE

Age in Grade IX	Total Number of Students	Number who passed		Number who failed	
		Actual	Expected	Actual	Expected
16	37	17	(22.5)	20	(14.5)
15	248	143	(150.7)	105	(97.3)
14	248	161	(150.7)	87	(97.3)
13	20	15	(12.2)	5	(7.8)
Total	553	336		217	

$X^2 = 7.89$ df = 3 P is equal to .05
C = .10 (slightly significant at the .05 level)

NOTE: The figures in parentheses represent independence values, which give the number of students who should be expected to pass and fail within each age group, in the absence of any real association between age and matriculation success and failure.

TABLE VI

STUDENTS' AGE IN GRADE IX IN RELATION TO SUBSEQUENT MATRICULATION SUCCESS OR FAILURE

Age group	Total Number of Students	Number who passed	Number who failed
15	285 (51.5%) = p	160 (28.9%)*	125 (22.6%)
14	268 (48.5%) = q	176 (31.8%)	92 (16.7%)
Totals	553 (100%)	336 (60.7%) = q^1	217 (39.3%) = p^1
R_{tet} = .16		SEr_{tet} = .07	

*The figures in parentheses indicate the percentage which this number of students equals, in relation to the entire group; therefore, the 160 students fifteen years of age and over, who passed, are equal to 28.9% of the total number of students in the study.

TABLE VII

STUDENTS' SEX IN RELATION TO SUBSEQUENT MATRICULATION SUCCESS OR FAILURE

Sex	Total Number of Students	Number who passed Actual	Number who passed Expected	Number who failed Actual	Number who failed Expected
Male	240	143	(145.8)	97	(94.2)
Female	313	193	(190.2)	120	(122.8)
Total	553	336		217	

$X^2 = .24$ df = 1 P lies between .50 and .70
C = .02 (not significant)

NOTE: The figures in parentheses represent independence values, which give the number of students who should be expected to pass and fail for each sex, in the absence of any real association between sex and matriculation success and failure.

Honor point findings. Table VIII indicates the relationship between the number of honor points obtained by Grade IX students and the students' subsequent matriculation success or failure. The null hypothesis was again used to test the significance of observed differences. With a X^2 of 104.87 and three degrees of freedom, P was found to be equal to less than .01. On this basis the null hypothesis was rejected. The relationship between honor points and the pass and fail criteria was considered very significant at less than the .01 level. Thus, the obtained C of .40 was also considered very significant at the .01 level.

Other findings. In an analysis of the data, it was found that the group of students failing to meet matriculation requirements was largely composed of students who had failed one or more subjects. Such students made up eighty-eight per cent of the entire fail group. The remaining twelve per cent of the fail group were accounted for by those students who had obtained a B or higher standing in six academic subjects, but who had failed to gain an overall average of sixty per cent.

Twenty-two per cent of the 217 students who were unsuccessful with the program had failed one subject; twenty-eight per cent had failed two; seventeen per cent had failed three, and twenty-one per cent had failed four subjects. Mathematics was by far the most troublesome subject; sixty-six per cent of the entire fail group had failed this subject. The other subjects, in their order of apparent difficulty, were Chemistry, Physics, Social Studies, English and

TABLE VIII

HONOR POINTS GAINED IN GRADE IX IN RELATION TO SUBSEQUENT MATRICULATION SUCCESS OR FAILURE

Number of Honor Points	Total Number of Students	Number who passed Actual	Expected	Number who failed Actual	Expected
20-24	264	215	(160.6)	49	(103.4)
15-19	247	114	(150.1)	133	(96.9)
10-14	39	6	(23.7)	33	(15.3)
0-9	3	1	(1.8)	2	(1.2)
Total	553	336		217	

$X^2 = 104.87$ df = 3 P is less than .01
C = .40 (very significant at the .01 level)

NOTE: The figures in parentheses represent independence values, which give the number of students who should be expected to pass and fail for each interval of honor points, in the absence of any real association between the number of honor points and matriculation success and failure.

French, and Biology and Latin.

In summary, fairly marked positive relationships were found between the criteria of matriculation success and failure and Grade IX General Test scores, departmental examination aggregate scores, relative class standing, and honor points. There were no significant differences between the number of boys and the number of girls passing and failing the matriculation program. Differences related to age were found to be slight and apparently negligible.

FOOTNOTES TO CHAPTER IV

[1]Province of Alberta, Department of Education, Summary of Results and Guide To The Interpretation Of The Grade IX General Test Administered June 1954 (1954) p. 1.

[2]Harold G. Seashore, How Effective Are Your Tests? (Reprints, The Test Service Bulletin, The Psychological Corporation, New York: Nos. 36-40, 1948-1950), p. 6.

[3]Henry E. Garrett, Statistics in Psychology and Education, (New York: Longmans, Green And Co., 1954), pp. 254-66.

[4]Ibid., p. 368.

[5]Ibid.

CHAPTER V

THE GUIDANCE SIGNIFICANCE OF THE FINDINGS

To find and report the statistical relationship between matriculation success and failure and the selected guidance factors constituted but one aspect of this study. The basic objective was to determine, on the basis of the findings of the study, the guidance value of the selected factors, and to present this information in a meaningful way. The development of an objective foundation for counselling students contemplating enrollment in the academic program of a Composite High School was, therefore, the aim of this section of the study.

Expectancy tables and their analysis. Table IX is an expectancy table based on the distribution of Grade IX General Test scores. This table shows the percentages of matriculation passes and failures to be expected on the basis of the observed results of this study in relation to General Test scores. It can be seen from this table that of the twenty-six students who scored between seventy and seventy-three on the Grade IX General Test, twenty went on to matriculate successfully, while six failed. In other words, seventy-seven per cent of the group passed and twenty-three per cent failed. It might be said, therefore, that students scoring between seventy and seventy-three in the future will, in most cases, be successful with the matriculation program. Similarly, those students scoring from sixty-six to sixty-nine, may reasonably be expected to

TABLE IX

PERCENTAGES OF EXPECTED MATRICULATION PASSES AND FAILURES IN RELATION TO OBSERVED GRADE IX GENERAL TEST SCORES

Observed Results				Expected Results	
Number of students	Number who passed	Number who failed	General Test Scores	Per cent expected to pass	Per cent expected to fail
26	20	6	70-73	77	23
97	82	15	66-69	85	15
107	73	34	62-65	68	32
111	64	47	58-61	55	45
95	56	39	54-57	59	41
49	20	29	50-53	41	59
38	12	26	46-49	32	68
18	8	10	42-45	44	56
7	1	6	38-41	14	86
2	-	2	34-37	-	100
3	-	3	30-33	-	100

pass the program. Subsequent entries in this table can be read in the same way. As one proceeds from the higher to the lower General Test scores, the percentage of pupils passing decreases, while the percentage of pupils failing increases.

Figure 1 consolidates the information pictured in Table IX by setting up wider intervals of General Test scores. This figure presents four significantly distinct groups of students in relation to their varying percentages of expected matriculation passes and failures. This type of grouping is desirable because the larger frequencies in each interval make possible a greater degree of confidence in the guidance which might be based on such information. From this figure it can be seen that of the students who scored sixty-six or more on the General Test, only seventeen per cent subsequently failed to meet matriculation requirements. It can be said, therefore, that students scoring in this range in the future have an excellent chance of passing a matriculation program. Further, it may be said that students who score from fifty-four to sixty-five have a fair chance of passing the program. However, students who score fifty-three or less are more likely to fail than pass. Students scoring not more than thirty-seven have apparently a very slim chance of passing a matriculation program.

Table X, page 45, is another expectancy table based on the distribution of Grade IX aggregate scores on external examinations. This table shows the percentages of matriculation passes and failures to be expected on the basis of the observed results of this study in

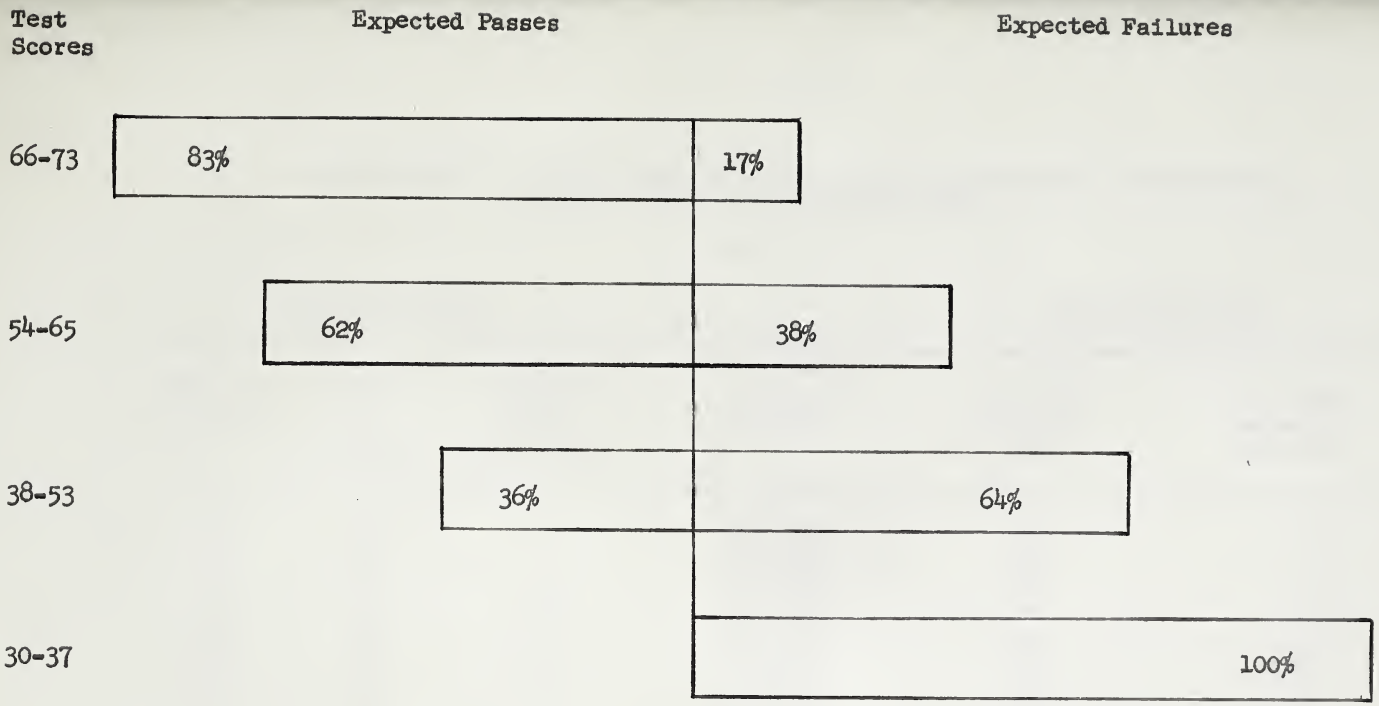

FIGURE I

Percentages of expected matriculation passes and failures of four significantly distinct groups of students in relation to observed Grade IX General Test Scores.

TABLE X

PERCENTAGES OF EXPECTED MATRICULATION PASSES AND FAILURES IN RELATION TO OBSERVED GRADE IX AGGREGATE SCORES

Observed Results				Expected Results	
Number of students	Number who passed	Number who failed	Aggregate Scores	Per cent expected to pass	Per cent expected to fail
19	17	2	500-525	89	11
38	37	1	475-499	97	3
79	66	13	450-474	84	16
70	52	18	425-449	74	26
88	65	23	400-424	74	26
102	45	57	375-399	44	56
84	36	48	350-374	43	57
35	14	21	325-349	40	60
28	4	24	300-324	14	86
5	-	5	275-299	-	100
4	-	4	250-274	-	100
1	-	1	225-249	-	100

relation to Grade IX aggregate scores. Of the nineteen pupils making an aggregate score of 500 or more, seventeen passed while two failed. Thus eighty-nine per cent of the students scoring in this interval passed and eleven per cent failed. On this basis it might be said that an extremely large percentage of the students making similar scores in the future, can be expected to pass the matriculation program. Subsequent entries in this table can be read in the same way. As one proceeds from the higher to the lower aggregate scores, the percentage of students passing decreases, while the percentage of students failing increases. It is very interesting to note that of the nineteen students making a Grade IX aggregate score of 500 and above, seventeen passed while two failed; this is equal to an eighty-nine per cent pass record. Thirty-eight students made an aggregate score of from 475 to 499; thirty-seven of these passed while one failed. This is equal to a ninety-seven per cent pass record, nine per cent better than that of the top group who scored 500 and above.

Figure 2 consolidates the information portrayed in Table X by setting up wider intervals of Grade IX aggregate scores. This figure presents five significantly distinct groups of students in relation to their varying percentages of expected matriculation passes and failures. On the basis of this figure, it may be said that students scoring 450 or more on the Grade IX departmental examinations have an excellent chance of passing the matriculation program. Only twelve per cent of the students who so scored subsequently failed. Students scoring from 400 to 449 can be said to

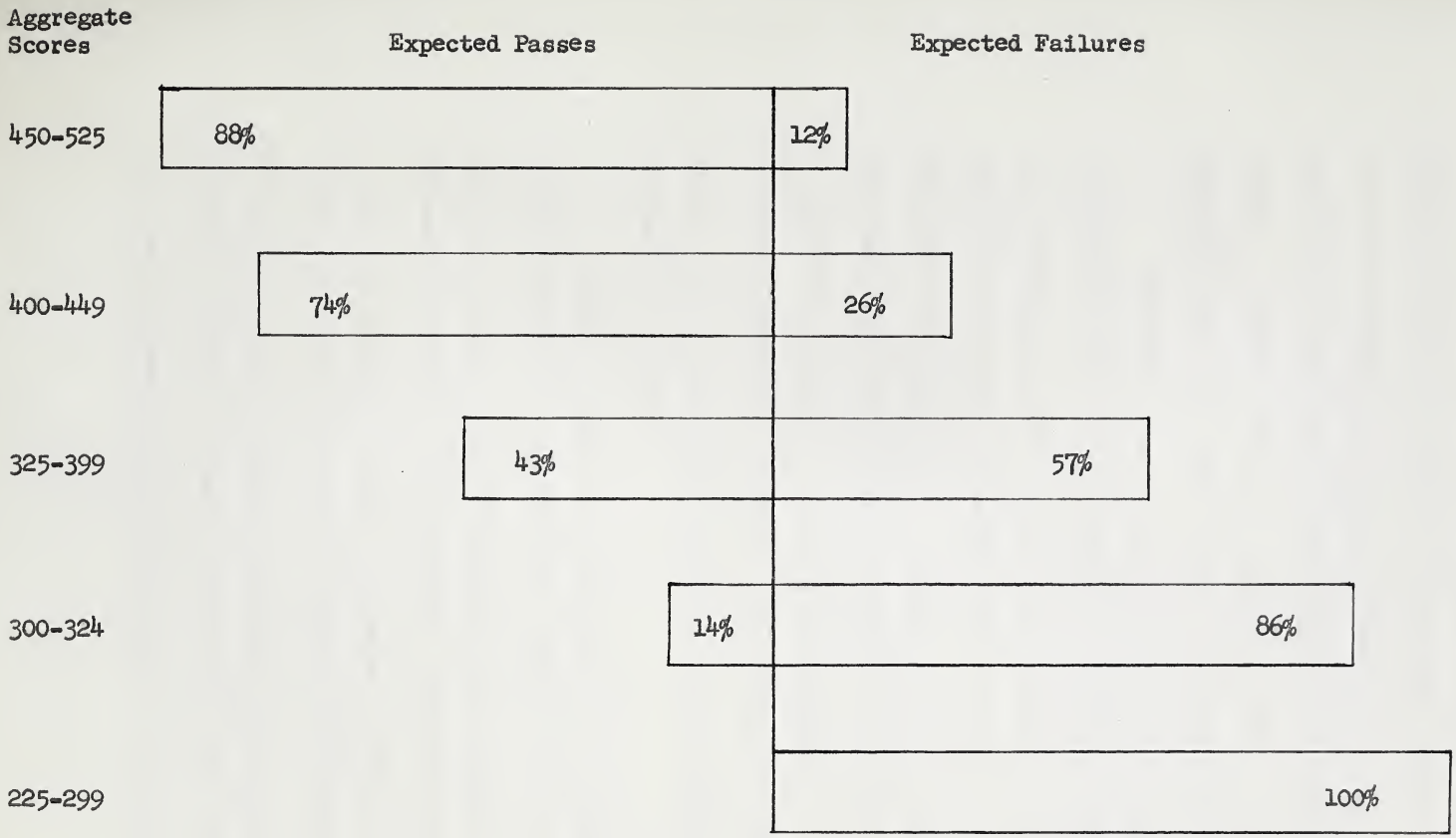

FIGURE 2

Percentages of expected matriculation passes and failures of five significantly distinct groups of students in relation to observed Grade IX aggregate scores on Departmental Examinations.

have a very good chance of meeting matriculation requirements, while students scoring from 300 to 399 are more likely to fail than pass. Of the few students who had an aggregate score of less than 300 on the Grade IX departmental examinations, all failed the matriculation program. Students making an aggregate score of not more than 324 apparently have very little chance of passing such a program.

Table XI shows the probable chances of success or failure of Composite High School students in relation to their relative class standing in Grade IX. Of the 385 students who placed in the top quarter of their respective Grade IX classes, 279 passed, while 106 failed the matriculation program. On this basis, it might be said that most of the students similarly placing in the future can be expected to pass the matriculation program. As one proceeds from the top to the bottom quarter of the class, the percentage of students passing consistently decreases while the percentage of students failing sharply increases.

Figure 3, page 50, consolidates the information pictured in Table XI into two significantly distinct groups of students in relation to their chances of matriculation success or failure on the basis of relative class standing. The first group is composed of those who finished in the top quarter of their respective Grade IX classes, and the second group is made up of students who placed in all other quarters. Students placing in the top quarter of their respective classes are seen to have a very good chance of successfully meeting matriculation requirements; specifically about 73 per

TABLE XI

PERCENTAGES OF EXPECTED MATRICULATION PASSES AND FAILURES IN RELATION TO OBSERVED GRADE IX RELATIVE CLASS STANDING

Number of students	Number who passed	Number who failed	Relative class standing	Per cent expected to pass	Per cent expected to fail
385	279	106	1st quarter	73	27
137	49	88	2nd quarter	36	64
27	7	20	3rd quarter	26	74
4	1	3	4th quarter	25	75

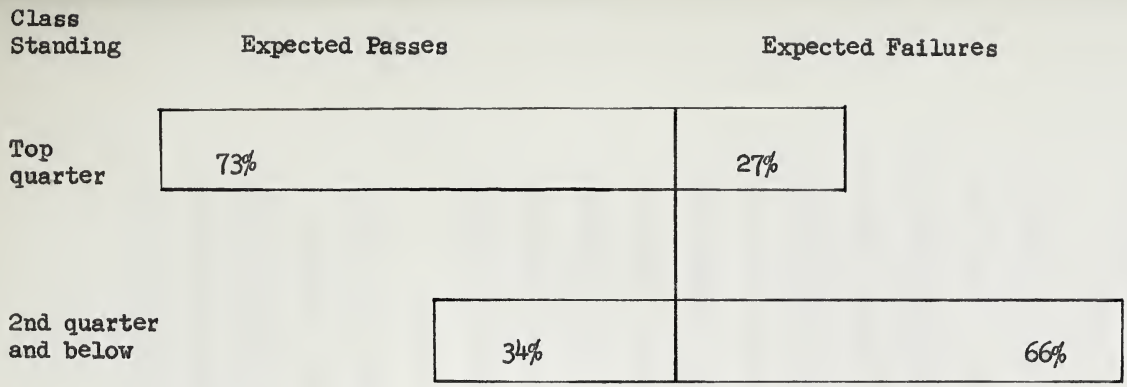

FIGURE 3

Percentages of expected matriculation passes and failures of two significantly distinct groups of students in relation to observed Grade IX relative class standing.

cent of such students might be expected to pass the program. All students who place below the top quarter of their class apparently have a poor chance of passing the matriculation program. Only about 34 per cent of the students who so place can be expected to succeed with the program. On this basis it might be said that to have a good chance of successfully completing the matriculation program, a student must place in the top quarter of his Grade IX class.

Table XII is based on the relationship between the number of honor points gained by a Grade IX student and his subsequent matriculation success or failure. This table shows the percentages of matriculation passes and failures to be expected on the basis of the observed results of this study in relation to the number of honor points obtained by students. The majority of students in this study gained from fifteen to twenty-four honor points. Of the 264 students who gained twenty or more honor points, 215 passed while 49 failed the matriculation program. As one proceeds from the greater to the lesser number of honor points gained, the percentage of pupils passing decreases markedly while the percentage of pupils failing increases to a correspondingly sharp degree.

Figure 4, page 53, consolidates the information contained in Table XII into three significantly distinct groups in relation to students' chances of matriculation success and failure on the basis of honor points gained. Thus, on the basis of this figure, students who merit from twenty to twenty-four honor points, the equivalent of at least five H's, might be said to have an excellent

TABLE XII

PERCENTAGES OF EXPECTED MATRICULATION PASSES AND FAILURES IN RELATION TO OBSERVED HONOR POINTS GAINED IN GRADE IX

Observed Results				Expected Results	
Number of students	Number who passed	Number who failed	Honor Points Gained	Per cent expected to pass	Per cent expected to fail
264	215	49	20-24	81	19
247	114	133	15-19	46	54
39	6	33	10-14	15	85
3	1	2	5-9	33	67

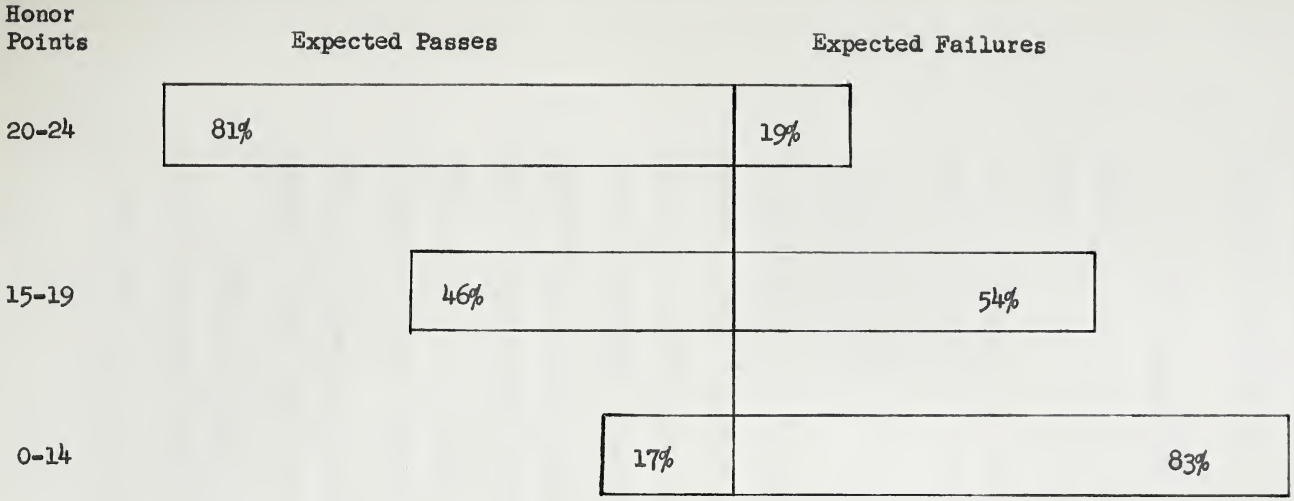

FIGURE 4

Percentages of expected matriculation passes and failures of three significantly distinct groups of students in relation to observed number of honor points gained in Grade IX.

chance of passing the matriculation program. Those who score from fifteen to nineteen honor points have about equal chances of passing and failing. Students who score less than fifteen honor points apparently have a very poor chance of meeting the Grade XII matriculation requirements.

The feasibility of establishing critical scores. At this point, the effects, and hence the advisibility, of establishing critical or cut-off scores in relation to entry into the matriculation program are examined. For this purpose, the critical scores used have been established on the basis of the information contained in this study. Critical scores are generally used in selection procedures. It is assumed, for the moment, that it might be desirable to select students for enrollment in the matriculation program. Following this assumption, it is suggested that students might well be advised on the same basis as that on which they would be selected. Information which appears to be useful in the hypothetical selection procedure would, therefore, be valuable from a guidance point of view. The objective in establishing a critical score is to locate an optimum point. This is the point at which a maximum number of students who would pass, and a minimum number of students who would fail, would be accepted for a particular program, in this case the matriculation program.

Figure 5 shows the effects of five different critical scores in relation to the General Test results. If the high score of fifty-four had been established as the critical General Test

Pass Students			1	8	12	20	56	64	73	82	20
Fail Students	3	2	6	10	26	29	39	47	34	15	6
General Test Scores	30-33	34-37	38-41	42-45	46-49	50-53	54-57	58-61	62-65	66-69	70-73

Critical Score	Pass Students		Fail Students	
	Accepted	Rejected	Accepted	Rejected
54	295 (88%)	41 (12%)	141 (65%)	76 (35%)
50	315 (94%)	21 (6%)	170 (78%)	47 (22%)
46	327 (98%)	9 (2%)	196 (90%)	21 (10%)
42	335 (99.7%)	1 (.3%)	206 (95%)	11 (5%)
38	336 (100%)	- -	212 (98%)	5 (2%)

FIGURE 5

Number and per cent of pass and fail students accepted and rejected in relation to five critical Grade IX General Test Scores.

Fail students	3	3	6	13	18	23	17	24	15	4
Percent age scores	(0-4)	(5-9)	(10-14)	(15-19)	(20-24)	(25-29)	(30-34)	(35-39)	(40-44)	(45-49)

Initial score	Pass students		Fail students	
	Accepted	Rejected	Accepted	Rejected
50	225 (68%)	11 (16%)	141 (85%)	76 (32%)
55	245 (74%)	21 (30%)	110 (76%)	47 (22%)
60	247 (80%)	9 (13%)	106 (70%)	51 (16%)
65	235 (92.7%)	1 (.3%)	88 (52%)	16 (5%)
70	326 (100%)	- -	218 (76%)	5 (1%)

Table 5

Number and percentage of pass and fail students accepted and rejected in relation to the initial score in general math course.

score, then 295 students or eighty-eight per cent of the group who actually passed the program would have been accepted in the program, while twelve per cent who actually passed, would have been rejected. This rejection of twelve per cent of the students who could have actually passed the program would be unacceptable to many who might maintain that no student who could have passed should be sacrificed in the selection procedure. On the other hand, the same critical score would have resulted in the rejection of thirty-five per cent of those students who actually failed the program. To determine the optimum point, the critical score was lowered to fifty, then forty-six, forty-two, and finally thirty-eight. As the critical score was thus lowered, the percentage of the pass students who would have been rejected was consistently being lowered; this feature was desirable. At the same time, however, the percentage of the fail group of students who would have been accepted was being increased; this was undesirable. If on the one hand a critical score of thirty-eight is looked upon as successful because at this point 100 per cent of those students who passed would have been accepted, it might well be termed inefficient on the other, because only five students or two per cent of those who failed would have been rejected from the program.

Figure 6 shows the effects of five cut-off scores in relation to Grade IX aggregate scores on external examinations. A critical score of 400 appears to be quite efficient; it approximately reverses the percentages of pass and fail students, accepted

Pass Students			4	14	36	45	65	52	66	37	19
Fail Students	5	5	24	21	48	57	23	18	13	1	2
Aggregate Scores	225-274	275-299	300-324	325-349	350-374	375-399	400-424	425-449	450-474	475-499	500-525

Critical Score	Pass Students		Fail Students	
	Accepted	Rejected	Accepted	Rejected
400	237 (71%)	99 (29%)	57 (26%)	160 (74%)
375	282 (84%)	54 (16%)	114 (53%)	103 (47%)
350	318 (95%)	18 (5%)	162 (75%)	55 (25%)
325	332 (99%)	4 (1%)	183 (84%)	34 (16%)
300	336 (100%)	- -	207 (95%)	10 (5%)

FIGURE 6

Number and per cent of pass and fail students accepted and rejected in relation to five critical Grade IX aggregate scores.

and rejected. Seventy-one per cent of the pass group would have been accepted and seventy-five per cent of the fail group would have been rejected. A critical score of 325 would have resulted in the acceptance into the matriculation program of ninety-nine per cent of those students who actually passed, and in the rejection of sixteen per cent of those students who failed. Further, to include 100 per cent of the pass group in the program it would be necessary to set the critical score at 300, at which point ninety-five per cent of the fail group would have been accepted.

Figure 7 pictures the results of four critical scores or quarters in relation to relative Grade IX class standing. When the top quarter was established as the cut-off quarter, the results appeared to be fairly efficient. At this point, eighty-three per cent of the pass group would have been accepted, while fifty-one per cent of the fail group would have been rejected. To include 100 per cent of the pass group, the bottom quarter must be used as the critical score. At this point, however, one hundred per cent of the fail group would also have been included for selection in the matriculation program.

Figure 8, page 60,presents the results of four critical scores in relation to the number of honor points gained by a Grade IX student. Using a critical score of fifteen honor points, ninety-eight per cent of the pass group would have been included in the program whereas sixteen per cent of the fail group would have been rejected. To select 100 per cent of the pass group the

Pass Students	1	7	49	279
Fail Students	3	20	88	106
Class Standing	bottom quarter	3rd quarter	2nd quarter	top quarter

Critical Score	Pass Students		Fail Students	
	Accepted	Rejected	Accepted	Rejected
top quarter	279 (83%)	57 (17%)	106 (49%)	111 (51%)
2nd quarter	328 (98%)	8 (2%)	194 (89%)	23 (11%)
3rd quarter	335 (99.7%)	1 (.3%)	214 (99%)	3 (1%)
bottom quarter	336 (100%)	- -	217 (100%)	- -

FIGURE 7

Number and per cent of pass and fail students accepted and rejected in relation to four critical Grade IX relative class positions.

Case Summary	2	7	22	17
Full Schedule	3	22	22	1.0 +
Cases Changing	bottom quarter	2nd quarter	1st quarter	1st quarter

Critical Score	Case Summary		Full Schedule	
	Accepted	Rejected	Accepted	Rejected
Top Quarter	472 (42%)	27 (11%)	240 (42%)	111 (14%)
2nd Quarter	282 (25%)	8 (3%)	224 (39%)	21 (11%)
3rd Quarter	329 (29.7%)	1 (.3%)	104 (18%)	2 (1%)
Bottom Quarter	324 (28.8%)	- -	111 (20%)	- -

Table 7

Number and per cent of pass and fail job applications are indicated in relation to four critical degree "C" scholastic grade averages.

Pass Students	1	6	114	215
Fail Students	2	33	133	49
Honor Points	5 - 9	10 - 14	15 - 19	20 - 24

Critical Score	Pass Students		Fail Students	
	Accepted	Rejected	Accepted	Rejected
20	215 (65%)	121 (35%)	49 (23%)	168 (77%)
15	329 (98%)	7 (2%)	182 (84%)	35 (16%)
10	335 (99.7%)	1 (.3%)	215 (99%)	2 (1%)
5	336 (100%)	- -	217 (100%)	- -

FIGURE 8

Number and per cent of pass and fail students accepted and rejected in relation to four critical honor point totals.

Term Students	1	0	114	215
Fall Students	0	15	132	19
Minor Points	5 - 9	10 - 14	15 - 19	20 - 24

Critical Score	Term Students		Fall Students	
	Accepted	Rejected	Accepted	Rejected
20	312 (67%)	121 (.26%)	40 (33%)	146 (77%)
15	320 (49%)	1 (.2%)	182 (84%)	25 (12%)
10	132 (29.4%)	1 (.3%)	213 (99%)	4 (1%)
4	326 (100%)	- -	217 (100%)	- -

Table 2

Number and per cent of pass and fail students accepted and rejected in relation to four critical score points tested.

critical score must be set at five honor points; at this point, 100 per cent of the fail group of students would also have been included in the selection for the program.

The major problem associated with the determination of critical scores is evident upon examination of the last four figures. As the critical score is altered so as to select a larger proportion of those students who would pass, the number of students selected, who would eventually fail, is simultaneously increased. Upon analysis of the effects of the preceding critical scores in Figures 5, page 55, Figure 6, page 57, Figure 7, page 59, and Figure 8, page 60, it was concluded that a selection procedure based on such scores would not be satisfactory.

Basis of guidance information at the Grade IX level. Students completing Grade IX can be reliably advised as to their chances of succeeding with a matriculation program in Composite High Schools. Grade IX General Test scores, aggregate scores on Grade IX departmental examinations, relative class standing in Grade IX, and honor points gained provide a sound basis for this advice. Such students' chances of success can be indicated by considering each of these guidance factors individually. However, considering them simultaneously, increases the reliability of the guidance. This point is illustrated in Tables IX, page 42, X, page 45, XI, page 49, and XII, page 52. Thus, students scoring 66 or more on the General Test were said to have a good chance of succeeding with the matriculation program. Nevertheless, 21 of

the students so scoring failed. Similarly, students making an aggregate score of 450 or more were said to have a good chance of passing the program. Sixteen of these students failed. Students gaining 20 or more honor points were also said to have a good chance of passing, but 49 of such students failed. Students placing in the top quarter of their Grade IX class were said to have a good chance of passing the program. Of such students, however, 106 subsequently failed the matriculation program. Some students, then, whose chances of success appeared to be good on the basis of individual guidance factors, went on to fail the program. Specifically, advising the students of this study to enroll in the matriculation program on the basis of individual factors, could have resulted in the failure of from 16 to 106 students. Guiding students on the basis of a single guidance factor is, then, not sufficiently reliable. This possible result was compared with that effected by considering the guidance factors of this study simultaneously. Thus, a student scoring 66 or more on the General Test, making an aggregate score of 450 or more, placing in the top quarter of his class, and gaining 20 or more honor points could be very reliably advised that he has an excellent chance of successfully completing the matriculation program. In fact, only five students who met these qualifications subsequently failed the program.

It can be said, therefore, that more reliable guidance is provided for prospective matriculation students when the guidance is based on a number of factors rather than on a single guidance factor.

CHAPTER VI

SUMMARY AND CONCLUSIONS

Summary of the findings:

1. A substantial positive relationship was found between:
   (a) Grade IX General Test scores and subsequent matriculation success and failure, and
   (b) Grade IX aggregate scores on departmental examinations and subsequent matriculation success and failure;
2. A very significant relationship was found between:
   (a) relative class standing in Grade IX and subsequent matriculation success and failure, and
   (b) the number of honor points gained by a Grade IX student and subsequent matriculation success and failure;
3. A substantial positive relationship was found between Grade IX General Test scores and Grade IX aggregate scores on departmental examinations;
4. A significant, though slight, relationship was found, at the .05 level, between a student's age in Grade IX and subsequent matriculation success and failure;
5. No significant relationship was found between sex and matriculation success and failure;
6. Eighty-eight per cent of the 217 students who failed to achieve matriculation standing did so because they did not

attain at least a B standing in one or more subjects. Twelve per cent failed because they did not obtain the overall average of sixty per cent, in spite of the fact that they passed all subjects.

7. More students failed Mathematics 30 than any other Grade XII subject. Sixty-six per cent of the students who failed to achieve matriculation standing were unsuccessful with this subject.

Conclusions. The findings of this study indicate that General Test scores, aggregate scores on departmental examinations, relative class standing, and honor points gained provide useful information for counselling Grade IX students. On the basis of a student's results on each of these four factors, he can be reliably advised on his chances of success in a matriculation program.

Among the four factors mentioned above, relative class standing seemed to be the most efficient single predictor of matriculation success. On the basis of this one factor alone, a sharp differentiation can be made between those students likely to pass and those likely to fail. This conclusion is similar to a finding at the college level by Williams and McQuary who reported that rank in high school was the best single predictor of college success.[1]

Some of the students studied in this investigation had good Grade IX records but subsequently failed the matriculation

program, while others with poor Grade IX records matriculated successfully. Apparently factors other than those studied in this thesis were responsible for the success or failure of these students. It could be reasonably assumed that the absence or presence of motivation may have been the deciding factor. Thus the importance of motivation must not be underestimated when counselling Grade IX students.

Recommendation for further study. The findings of this investigation indicate that it is possible to advise Grade IX students as to their chances of success in a matriculation program in Composite High Schools. However, some students do not conform to the usual pattern. In this study, for example, two of the nineteen students who made Grade IX aggregate scores of five hundred or more (v.Table X, page 45), failed to matriculate. Future study of such exceptions might reveal their distinguishing characteristics and thus make possible the isolation and subsequent guidance of these students.

[1]H.V. Williams, and John P. McQuary, "The High School Performance of College Freshmen," Educational Administration and Supervision, 39:303-8, May, 1953.

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